

IV. Remarks

Upon entry of this Amendment accompanying Applicants' Request for Continued Examination, claims 2, 3, 5, 6, 9, 12, 14, 15-17, 20, 21, and 26-32 are pending in this application. Specifically, claims 4, 7, 8, 18, 19, and 22-25 have been cancelled (including independent method claim 22), while independent claims 15 and 27 have respectively been amended to include the limitations of former dependent claims 18, and of claims 4 and 8 (the seal material is molded of "flexible" material, meaning "relatively soft" and "compliant," as disclosed at specification page 8, lines 22-23), as well as of former dependent claims 19 and 7 (a spring "within" the seal "providing preload force towards" the respective shaft member's spline). The remaining claims were amended to provide proper antecedent basis in the preamble, to correct dependencies in view of the cancelled claims, and to otherwise more particularly point out and distinctly claim that which Applicants regards as the invention, 35 U.S.C. §112, second paragraph. Finally, the recited limitation of original claim 15, that the first diameter is greater than the second diameter, has been deleted and now appears in new dependent claim 32. No new matter has been added by these amendments. Reconsideration and further examination of claims 2, 3, 5, 6, 9, 12, 14, 15-17, 20, 21, and 26-32 are respectfully requested.

Claims 2, 3, 5, 6, 9, 12, 14, 15-17, 20, 21, and 26-31 stand finally rejected in Paper #9 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,460,182 ("Brissette") in view of U.S. Patent No. 5,525,112 ("Smith").

Brissette teaches a slip-type drive shaft in which a "resilient one piece sealing member 16" provides a seal between two relatively-longitudinally-sliding shaft members (col. 2, lines 61-63). Brissette teaches that the "preferred sealing member 40 (sic: 16) is made out of a resilient material, usually neoprene rubber, with a durometer hardness of 60 to 70 and a minimum tensile strength of 2000 psi (140 kg/cm²)" (col. 3, lines 18-21). Due to its particular material and its disclosed square cross-section, Brissette teaches that "the resulting close contact between edges 60 and shaft 34 will generally prevent lubricant from leaking out of cavities 38 and 40 of slip yoke 12 and prevent dust from entering" (col. 3, lines 26-45).

Thus, Brissette expressly uses the resiliency of the specific material from which the sealing member 16 is formed, as well as its specific square-cross sectional molded shape, to achieve the disclosed “resulting close contact” of the seal’s “edges 60” and the shaft 34. As such, Brissette neither teaches nor suggests a seal for a telescoping driveshaft, or a driveshaft assembly incorporating a seal, in which the seal’s “relatively soft, compliant” material is resiliently biased toward the shaft, not by the material’s own resiliency and molded shape, but by a spring member that is disposed within the molded seal itself, as recited in Applicants’ amended independent claims 15 and 27. Indeed, Brissette’s divergent teaching is emphasized by the rather rigid properties of its preferred seal material, which simply cannot be characterized as a “relatively soft, compliant” material as recited by Applicants in independent claims 15 and 27.

And, contrary to the Examiner’s characterization of Smith at page 4 of the Detailed Action as teaching a “garter spring” molded within a seal that provides a preload force towards a shaft spline, Smith in fact discloses a seal-to-steering shaft engagement that, like Brissette, relies upon the resiliency of the material, rather than an integrally-molded spring, to achieve the desired “resilient engagement:”

The sealing lips 30c extend inwardly into resilient engagement with the splines 21a formed on male splined steering shaft member 21. If desired, an annular metallic band 32 may be provided around or embedded within the combined seal and boot assembly 30 so as to extend circumferentially about the sealing lips 30c. The metallic band 32 is provided to maintain the resilient engagement with the splines 21a formed on male splined steering shaft member 21. Because of this resilient engagement, the sealing lips 30c prevent dirt and other contamination from entering into the region of the mating splines 21a and 25a.

(Smith, col. 5, lines 37-48). Thus, while Smith’s “annular metallic band 32” provides a backing for the resilient sealing lips 30c that bias themselves against the shaft, there is no teaching or suggestion that Smith’s “band” in any way operates to bias

the sealing lips toward the shaft. Simply stated, Smith continues to follow Brissette's teaching, that the resilient seal material will itself achieve the desired seal.

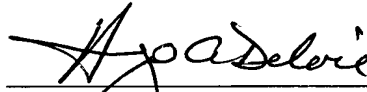
In this way, Brissette and Smith teach away from the claimed invention, which utilizes a "relatively soft, compliant" seal material that is radially inwardly biased towards the shaft's spline by the imbedded spring. By way of further emphasis, dependent claim 9 recites that the imbedded spring is a "garter spring," by which Applicants' invention advantageously achieves substantially uniform (radial) sealing pressures that are likely not possible with Smith's rigid and nonconfirming seal material.

In view of the foregoing, I Applicants respectfully submit that claims 2, 3, 5, 6, 9, 12, 14, 15-17, 20, 21, and 26-32 now patentably define over the references of record in this application, and the allowance of claims 2, 3, 5, 6, 9, 12, 14, 15-17, 20, 21, and 26-32 is respectfully solicited.

Respectfully submitted,

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Date



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Attachments: Two Replacement Sheets of Drawings (Sheet 2/7 and Sheet 4/7)
Two Annotated Sheets of Drawings